

CLAIM AMENDMENTS

1. (Currently Amended) A waveguide type light ~~receiving~~ detecting element ~~shared~~ for a detecting multiwavelength-band signal light, comprising:

a semi-insulating semiconductor substrate; and

an optical waveguide layer ~~disposed over~~ supported by the semiconductor substrate, said optical waveguide layer ~~being formed by~~ including, sequentially ~~laminating~~ laminated from the semiconductor substrate side, a first conductivity type first cladding layer connected to a first electrode, a first conductivity type first optical guide layer, an optical absorbing layer, a second conductivity type second optical guide layer, and a second conductivity type second cladding layer connected to a second electrode, wherein,

when a center wavelength of a first signal light wavelength band corresponding to ~~the~~ a shortest signal light wavelength band is defined as  $\lambda_1$ , a center wavelength of a second signal light wavelength band is defined as  $\lambda_2$  ( $\lambda_2 > \lambda_1$ ), and a composition wavelength of a material for each of the first and second cladding layers is defined as  $\lambda_a$ , a composition wavelength,  $\lambda_g$ , of a material ~~for~~ of each of the first and second optical guide layers satisfies  $\lambda_a < \lambda_g < \lambda_1$  ~~such so~~ so that the first and second optical guide layers ~~become~~ are transparent to the first signal light, and

~~wherein~~ when the thickness of each of the first and second optical guide layers, corresponding to an extreme value in which ~~an~~ inclination of a sensitivity curve of ~~said~~  $\lambda_1$  with respect to a change in the thickness of each of the first and second optical guide layers changes from positive to negative, is defined as  $d_1$ , and the thickness of each of the first and second optical guide layers, corresponding to an extreme value in which ~~an~~ inclination of a sensitivity curve of ~~said~~  $\lambda_2$  with respect to the change in the thickness of each of the first and second optical guide layers changes from positive to negative, is defined as  $d_2$ , the thickness,  $d_g$ , of the first and second optical guide layers satisfies  $0.75d_1 \leq d_g \leq 1.25d_2$ .

2. (Currently Amended) The waveguide type light ~~receiving~~ detecting element according to claim 1, wherein, when the thickness of the optical absorbing layer is defined as  $d_a$ , ~~the thickness thereof satisfies~~  $0.3\mu\text{m} \leq d_a \leq 0.5\mu\text{m}$ .

3. (Currently Amended) The waveguide type light ~~receiving~~ detecting element according to claim 1, wherein each of the first and second cladding layers is ~~formed of~~ InP, and a the composition wavelength  $\lambda_g$  of a material ~~for~~ each of the first and second optical guide layers is fixed with composition wavelengths of the first and second cladding layers as

$\lambda_a = 0.92\mu\text{m}$  and  $\lambda_1 = 1.3\mu\text{m}$ , and ~~with~~  $\lambda_2 = 1.55\mu\text{m}$ , the thickness,  $d_g$ , of the first and second optical guide layers satisfies  $0.3\mu\text{m} \leq d_g \leq 0.75\mu\text{m}$  with  $d_1 = 0.4\mu\text{m}$  and  $d_2 = 0.6\mu\text{m}$ .

4. (Currently Amended) The waveguide type light ~~receiving~~ detecting element according to ~~claims~~ claim 1, wherein each of the first and second optical guide layers is ~~composed of an InGaAsP semiconductor material.~~

5. (Currently Amended) The waveguide type light ~~receiving~~ detecting element according to ~~claims~~ claim 1, wherein each of the first and second optical guide layers is ~~made up of an AlInGaAsP semiconductor material.~~

6. (Currently Amended) The waveguide type light ~~receiving~~ detecting element according to ~~claims~~ claim 1, wherein each of the first and second optical guide layers is ~~composed of a GaInNAs semiconductor material.~~

7. (Currently Amended) The waveguide type light ~~receiving~~ detecting element according to ~~claims~~ claim 1, ~~wherein~~ including a low refractive index layer ~~composed~~ of a material lower than the optical absorbing layer in refractive index ~~is~~ disposed on side faces of a waveguide.